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ABSTRACT

This paper reviews the results of research on various programs for learning French as a second language from kindergarten to grade 11 or 12 in selected Canadian school systems. Generally, it examines the effects of a number of factors on French learning, such as student selection procedures and student ability, starting age, total amount of time spent using French, continuity of exposure to French, instruments, and other methodological considerations. The introduction provides a brief history of immersion programs in Canada and a review of research on results of these programs. The second chapter provides an overview of French immersion programs across Canada and describes in detail programs in Ottawa, Carleton, Edmonton, Montreal, and Mille Isles. Part III, the longest part of the report, is concerned with what research into the various programs has had to say about what aspects of programs might be most effective in another setting. This review covers the following topics: time allocations and French learning; the Ottawa Board of Education (OBE) French Project Results; methodological notes on tests, research designs, program stage and cohort variation; and study results regarding growth, cumulative time, maintenance, starting age and dosage. The final part of the report summarizes the research and conclusions, and advances hypotheses concerning French learning and maintenance. (Author/AMH)

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# FRENCH IMMERSION PROGRAMS ACROSS CANADA: THE INFLUENCE OF CUMULATIVE AMOUNTS OF TIME, STARTING AGE AND YEARLY TIME ALLOTMENT ON THE LEARNING OF FRENCH

## A Review of Evaluations of French Immersion Programs

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G.L. MacNab

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## I. INTRODUCTION

This paper reviews the results of research on various programs for learning French as a second language from kindergarten to grade 11 or 12 in selected tax-supported school systems. The question set was not, in the first instance, precisely stated. This introduction will describe how the question has been articulated and what the reader can expect from the rest of the paper.

In broad terms, this report examines the effects on French learning (the dependent variable) of a number of factors, such as student selection procedures and student ability, starting age, total amount of time spent using French, continuity of exposure to French, instruments and other methodological considerations. From the beginning, the issues have been examined with the object of providing information to a planner who is responsible for designing one or more programs for anglophone children who wish to become bilingual.* It was recognized that the planner has to work with certain given conditions; he must take children as they come with their widely varied abilities and motivations and he knows that not all teachers are excellent. What he can alter are curriculum content and time allocations within the school day.

It is now about fifteen years, a single school generation, since the first French immersion (or home-school language switch) program was introduced at St. Lambert. The idea of immersion is to put the young anglophone

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* The goal of full bilingualism is made because immersion programs were the original focus of the study, and also for methodological reasons, because use of tests normed on a francophone population was common in the research examined. In addition, it is not difficult to interpolate findings based on this assumption to other less ambitious programs.

child in a French environment and quickly develop listening comprehension and speaking skills. It then proceeds with the normal school curriculum taught in French (except for English language arts). In this way, time for French learning was not taken away from other subjects, but, in a sense, added to them. French becomes a working language, used every day, to talk about mathematics, geography or drawing.

The fact that immersion worked and continues to work as it has been introduced across the country (in Canada, over 125 school systems have one or more immersion programs) is surely one of the major educational innovations of the century. In some systems a third of the kindergarten enrolment opts for immersion. The program is no longer an experimental program taught by a few dedicated crusaders who worked nights to create their curriculum materials, but is an established program, with average, run-of-the-mill teachers continuing the work of the pioneers.

The basic premise of the immersion programs (including partial immersion, extended and intensive French) is that the anglphone child shall develop proficiency in French <u>in addition to</u> learning all the normal subjects - mathematics, social, scientific and environmental studies, aesthetics, physical education, and English language skills. The pioneer programs were carefully monitored to see that losses in other subjects were not excessive. Research found that early deficiencies in English skills were recovered by grade 4 or so, and that over the course of the elementary school program children added the French with no measured loss in other subjects. Variations of entry-points showed different patterms of initial effects on the learning of subjects other than French, but followed the long run finding of no loss.

The review of the research literature quickly leads to a realization that all immersion programs seemed to share this achievement, that they taught a great deal of French without measurable loss in English, mathematics or other academic learning. Because learning in other subjects by immersion students seemed consistently equal to (or better than) that of comparison students, it seemed reasonable to focus on the French learning, which was the primary aim of the study in any case.

The fact that the schools can add French with no loss elsewhere in the curriculum is a challenge that regular programs have been slow to take up. Arguments that immersion attracts the brighter children overlook the fact that the comparisons have been made on samples matched for measured IQ (or adjusted for differences). The complacent, "Oh, but we teach other things," is seldon accompanied by a statement specifying what those other things might be. It is unfortunate that the challenge has not generated more interest in the regular program because it may well be that there are "other things" or losses on the part of immersion that are simply not yet measured. A further examintion of the regular program might lead to better test instruments and to a better understanding of the relation between education and learning.

When one attempts to compare programs at different boards with respect to their success in developing French proficiency, methodological problems become apparent. Different tests are used by various boards or researchers. The samples of children to be tested, both immersion and comparison, are chosen differently at different boards and may come from different segments of the population; there is no control, really, since students themselves

opt for one program or another. Tests given must be changed as children mature and as they learn more French. Thus, it is not possible to say, "The program at board X is better than the one at board Y".

The issue of what is the best starting age and best pattern of time is, therefore, not resolvable from the data available to the writer. Probably there is no one best starting time or pattern.

In any case, the data have been used to come at the problem indirectly, by attempting to see what the various tests might say about how fast and how completely children of different ages learn French. Various research results have been used to hypothesize a number of variables that might affect this learning and an attempt has been made to relate these to how much children might learn in a year. Then the data have been reexamined to find out how well it fits the hypothesis. This study of results and "learning curves" is contained in the middle section of the report, Section III.

The section of the report following this introduction simply describes some of the variations of French immersion available. An overview of immersion programs throughout Canada, based on material from the Canadian Parents for French, is then presented and a few of the programs are discussed in detail.

The body of the report contains a study of the results in detail with particular reference to the variables which might affect the learning of French. The report concludes with a brief summary and a discussion, including consideration of some characteristics of children opting for immersion and how these "self-selection" characteristics might be relevant to program design.

## II. FRENCH PROGRAMS ACROSS CANADA

After the success of the early French immersion programs in St. Lambert, other school boards began to initiate immersion or intensified French as a second language program. The Ottawa area boards, as befits the National Capital, were among the first to do so, with pilot classes started before the end of the 1960's.

Canadian Parents for French, who collect data on French programs across Canada every year, reported that at least 125 boards offered immersion, bilingual, partial immersion or some other type of intensive French program during the school year 1979-1980. This represents about a quarter of the English boards across Canada and includes most of the larger city boards. Many of these programs are in their first, second or third year.

TABLE 1

IMMERSION PROGRAMS IN CANADA, 1979-80

| | |
|---|---|
| Number of boards offering immersion, bilingual or intensive French programs | 125 |
| Number of boards offering more than one immersion, bilingual or intensive French programs | 33 |
| Number of boards offering an immersion, bilingual or intensive French program to children in grades 3 or higher only | 9 |
| Number of programs which offer 50% French or less each year | 19 |
| Number of programs which offer 60% French each year | 4 |

Thirty-three of the boards offer more than one program as defined by different grades for entry or by very different time allocations (e.g., 100% vs 50% of time spent in French). Thus, there are 158 board/programs offered. The following percentages are based on this number.

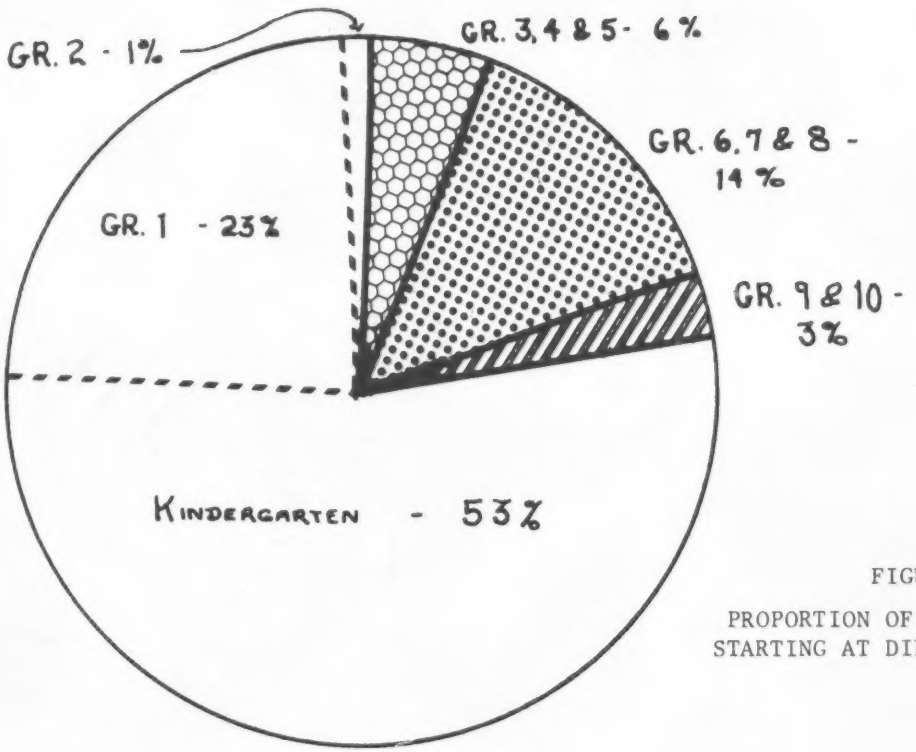



FIGURE I.

PROPORTION OF IMMERSION PROGRAMS STARTING AT DIFFERENT GRADE LEVELS.

SOURCE: CANADIAN PARENTS FOR FRENCH.

Of the programs offered, most (76 per cent) are kindergarten or grade 1 entry programs (Figure I). Some of the grade 1 entry programs are in boards without kindergartens. Twenty-two programs start at grade 6, 7 or 8 (14 per cent). There are nine programs starting in grades 3, 4 or 5, and four starting at grade 9 or above. Although there are a total of 35 programs starting in grade 3 or after, only nine of these are offered by boards who do not also have a primary (kindergarten or grade 1) entry program (7 per cent of boards).

Most of the programs listed are immersion programs with two or three years when 75 to 100 per cent of the program is in French. However, 19 of those listed are intensive or bilingual programs where no more than 50 per cent, and sometimes as little as 20 per cent, of the time is ever spent in French. Another three programs have a single introductory year where 90 to 100 per cent of the time is spent in French, followed by a 50 per cent or less allocation. Five programs have allocated 60 per cent of the time to French throughout.

The programs offered seem to vary by province. "Typical" time allocations for early-entry immersion can be identified for most of the provinces (Table 2). New Brunswick, Ontario and British Columbia typically begin their programs with two or three years where 100 per cent of the instruction is in French. English is then introduced slowly, reaching 50 per cent only

TABLE 2

TYPICAL PRIMARY IMMERSION PROGRAMS BY PROVINCE
(IN PER CENT OF TIME IN FRENCH)

| Province | K | Gr.1 | Gr.2 | Gr.3 | Gr.4 | Gr.5 | Gr.6 |
|---|---|---|---|---|---|---|---|
| New Brunswick | X | 100 | 100 | 100 | 75<br>90 | 65<br>80 | 40 |
| Prince Edward Island | X | 90 | 90 | 70 | 70 | 45 | ? |
| British Columbia | 100 | 100 | 100 | 60<br>80 | 50<br>70 | 50<br>70 | 50<br>70 |
| Alberta | 80<br>100 | 60<br>80 | 60<br>80 | 50<br>80 | ? | ? | ? |
| Saskatchewan | 75<br>100 | 75<br>80 | 75<br>80 | 60<br>70 | 50 | 50 | ? |
| Manitoba | 100 | 80 | 80 | 75 | 75 | 75 | 75 |
| Ontario | 100 | 100 | 80<br>100 | 80 | 65<br>80 | 65 | 50 |

Source: Canadian Parents for French

by grade 6 as a rule. The prairie provinces, on the other hand, typically begin their programs with no more than one year of 100 per cent French and many programs never offer a 100 per cent year. They also tend to taper off more quickly. Prince Edward Island boards follow patterns similar to the Prairies. There were too few boards reported in Newfoundland, Nova Scotia or Quebec to generalize.

Few boards have programs which had reached grade 8 (or for late immersion, grade 12) and many had not reached grade 6. Thus, in most cases patterns of maintenance of French skills in middle or intermediate grades and in secondary schools are not yet established.

Some Programs in Detail

The next section, which will look at learning results, relies on data from a few well-researched boards. In this section we will examine the programs at those boards in some detail.

Table 3 is the "conversion" table that has been used to translate the minutes per day (or per week divided by 5) or the per cent of the day into hours per year. This is, essentially, the scheme used by the Ministry of Education, Ontario. It is based on a "standard" school day of 300 minutes per school day, and 180 days per school year. Observations based on experience, looking in detail at two Ottawa area boards of education show that individual elementary schools vary in the minutes per day that students are actually in classrooms. Furthermore, secondary and intermediate schools tend to have somewhat longer days. Therefore, the cumulative hours given for various programs must be regarded as approximate.

TABLE 3

THE RELATIONSHIP BETWEEN TIME PER DAY AND HOURS PER YEAR USED IN DESCRIBING FRENCH PROGRAMS

| | Per cent of program | Minutes per day | Hours per year |
|---|---|---|---|
| Core programs | 5 | 15 | 45 |
| | 7 | 20 | 60 |
| | 10 | 30 | 90 |
| | 13 | 40 | 120 |
| | 15 | 45 | 135 |
| Extended programs | 20 | 60 | 180 |
| | 25 | 75 | 225 |
| | 30 | 90 | 270 |
| Bilingual programs | 40 | 120 | 360 |
| | 50 | 150 | 450 |
| | 60 | 180 | 540 |
| | 65 | 195 | 585 |
| | 70 | 210 | 630 |
| Immersion programs | 75 | 225 | 675 |
| | 80 | 240 | 720 |
| | 85 | 255 | 765 |
| | 90 | 270 | 810 |
| | 100 | 300 | 900 |

Ottawa Carleton: Table 4 shows the scheme for various programs in the public schools of Ottawa and Carleton. Until about 1980, the daily time devoted to French up to grade 5 in Carleton's core program was about half that of Ottawa. The kindergarten-entry immersion program at both boards is patterned on the St. Lambert program and times are virtually identical except that the Carleton Board provides somewhat less time in French in grades 5 and 6. The Ottawa Board provides two entry points into an intensive French program after kindergarten. Students may elect a program beginning with a full immersion year in grade 6 followed by 50 per cent French thereafter, or may enter a bilingual program in

grade 9. During a three-year period when the intermediate immersion programs were being established, students were also able to enter a bilingual program in grade 7 or grade 8. Learning results for these short-lived programs are included in Section III. Carleton Board's intermediate-entry program begins in grade 7, has two years 80 per cent in French, and then the option of an enriched high school experience.

TABLE 4

PER CENT OF TIME AND CUMULATIVE HOURS IN FRENCH IN ALTERNATIVE SECOND LANGUAGE PROGRAMS IN OTTAWA-CARLETON PUBLIC SCHOOLS

| Program | K-entry immersion | OBE core | OBE gr.6 entry imm.[a] | OBE gr.9 entry imm. | CBE core | CBE gr.7 entry imm. |
|---|---|---|---|---|---|---|
| Per cent of time | | | | | | |
| At grade: K* | 100 | 20 | 10 | 20 | 10 | 10 |
| 1 | 100 | 13 | 7 | 13 | 7 | 7 |
| 2 | 80 | 13 | 7 | 13 | 7 | 7 |
| 3 | 80 | 13 | 7 | 13 | 7 | 7 |
| 4 | 80 | 13 | 7 | 13 | 7 | 7 |
| 5 | 60-80 | 13 | 7 | 13 | 7 | 7 |
| 6 | 50-60 | 13 | 100 | 13 | 13 | 13 |
| 7 | 50 | 13 | 50 | 13 | 13 | 80 |
| 8 | 50 | 13 | 50 | 13 | 13 | 80 |
| 9 | 30-40 | 13 | 50 | 50 | 13 | 30 |
| 10 | 30-40 | 13 | 50 | 50 | 13 | 30 |
| 11 | 30-40 | 13 | 50 | 50 | 13 | 30 |
| 12 | 30-40 | 13 | 50 | 50 | 13 | 30 |
| Cumulative hours[b] | | | | | | |
| To grade 6 | 4870 | 810 | 1245 | 810 | 465 | 465 |
| 8 | 5770 | 1050 | 2145 | 1050 | 705 | 1905 |
| 12 | 7210 | 1530 | 3985 | 2850 | 1185 | 2985 |
| To start of intensive year: | N.1 | N/A | 345 | 1050 | N/A | 465 |
| At grade: | K | | 6 | 9 | | 7 |

* indicates half-day program

a. prior to cohorts entering kindergarten in 1970, grade 6 in 1977

b. where a range of times are given for some grades this equals a maximum

All the immersion and bilingual programs at these boards are optional and no formal screening procedures restrict enrolment. The French portions of the programs are taught by different teachers than the English portion, with the French teacher usually acting as a monolingual while in the classroom.

Table 5 shows the schema for the Ottawa and Carleton separate boards. Over the years these boards have experimented with several innovative programs. However, financial and administrative problems have forced some of them to be abandoned. In both boards some form of intensive French, including a half-day at the kindergarten level, has been the "regular" program. Parents and students do have the option of taking less. However, the Ottawa separate board appears to have had a more active role in advising parents about the programs that might be most suitable for their child. While the Board was able to offer a full-day fifty-fifty kindergarten, such advice was based on kindergarten performance. Like the public boards in the area, the separate schools have different teachers teach the French and English parts of the program.

TABLE 5

PER CENT OF TIME AND CUMULATIVE HOURS IN FRENCH OF ALTERNATIVE SECOND LANGUAGE PROGRAMS IN OTTAWA-CARLETON SEPARATE SCHOOLS

| Program | CRCSSB Core [a] | CRCSSB Intensive [b] | CRCSSB Immersion | CRCSSB Immersion | CRCSSB Intensive | CRCSSB Early Imm. | CRCSSB Extended [c] | CRCSSB Bilingual | CRCSSB Late Imm. |
|---|---|---|---|---|---|---|---|---|---|
| **Per cent of time** | | | | | | | | | |
| At grade: K | 7* | 100* | 100* | 100* | 100* | 50** | 50** | 100* | approx. 10 |
| 1 | 13 | 25-30 | 22 | 22 | 22 | 90 | 25 | 50 | " 10 |
| 2 | 13 | 25-30 | 22 | 22 | 22 | 90 | 25 | 50 | " 10 |
| 3 | 13 | 25-30 | 22 | 22 | 22 | 75 | 25 | 50 | " 10 |
| 4 | 13 | 25 | 50 | 22 | 22 | 50 | 20 | 50 | " 10 |
| 5 | 13 | 25 | 50 | 22 | 22 | 50 | 10 | 50 | " 10 |
| 6 | 13 | 25 | 50 | 22 | 22 | 50 | 10 | 50 | 10 |
| 7 | 13 | 25 | 50 | 75 | 22 | 50 | 15 | 50 | 75 |
| 8 | 13 | 25 | 50 | 40 | 22 | 50 | 15 | 50 | 75 |
| 9 | 13 | 13.3 | | | | | | | |
| 10 | 13 | 13.3 | | | | | | | |
| **Cumulative hours** | | | | | | | | | |
| To grade: 6 | 780 | 1935 | 2385 | 1620 | 1620 | 4095 | 1485 | 3150 | 630 |
| 8 | 1020 | 2385 | 3285 | 2655 | 2010 | 4995 | 1755 | 4050 | 1980 |
| 10 | 1260 | 2625 | ? | ? | ? | ? | ? | ? | ? |
| To start of intensive year: | N/A | | Nil | Nil | Nil | Nil | Nil | Nil | 630 |
| At grade: | | K | K | K | K | K | K | K | 7 |

* of Half-day
** of Full Day

a. Since 1973
b. 1972-77 (never fully implemented)
c. Discontinued

Edmonton. Edmonton Public School Board has an active second language program which includes bilingual programs in Ukrainian, German and Hebrew, as well as French. Cree was to be added to the list in the fall of 1981. These programs generally are about 60 per cent second language, but they differ in the way reading skills are introduced at grade 1. In the French program reading is taught in English until November, when French reading is begun. The Ukrainian program does not formally introduce Ukrainian reading until grade 2. The German program begins reading in the second language and introduces English reading at mid-year in grade 1. Both Hebrew and English reading are begun at the same time in the Hebrew program. The language coordinator says all seem to work.

The French second language alternatives are varied, including core programs starting in grade 7, extended in grade 4 and bilingual options at kindergarten, grade 4 and grade 7 (Table 6). In September, 1980, a full kindergarten-entry immersion (in the St. Lambert pattern) was introduced.

The French programs have several features that are not found in the Ottawa or Montreal programs. First, the same teacher teaches both the English and French portions of the program. Because the same teacher is with the class throughout the day actual time allotments differ from 60 per cent, ranging from 50 to 80 per cent.

Another feature of the program is a late-entry program which enables anglophones with no French to join the immersion class as late as grade 3. A special six-week intensive catch-up program is provided for these late-entry students and their progress is carefully monitored.

TABLE 6

PER CENT OF TIME AND CUMULATIVE HOURS IN FRENCH OF ALTERNATIVE SECOND LANGUAGE PROGRAMS IN EDMONTON PUBLIC SCHOOLS[a]

| Program | | FSL | Extended | Late Biling. | Int. Biling. | K-Biling. | K-Imm. |
|---|---|---|---|---|---|---|---|
| Per cent of time | | | | | | | |
| At grade: | K | | | | | 100 | 100 |
| | 1 | | | | | 60 | 100 |
| | 2 | | | | | 60 | 80 |
| | 3 | | | | | 60 | 70 |
| | 4 | | 20 | 0 or 20 | 70 | 60 | 70 |
| | 5 | | 20 | 0 or 20 | 70 | 60 | 50 |
| | 6 | | 20 | 0 or 20 | 50 | 60 | 50 |
| | 7 | 10 | 16 | 60 | 50 | 50 | 50 |
| | 8 | 10 | 10 | 60 | 50 | 50 | 50 |
| | 9 | 10 | 10 | 60 | 50 | 50 | 50 |
| | 10 | 14 or more | b | b | b | b | b |
| | 11 | 14 or more | b | b | b | b | b |
| | 12 | 14 or more | b | b | b | b | b |
| Cumulative hours | | | | | | | |
| To grade | 6 | Nil | 540 | Nil or 540 | 1710 | 3690 | 4230 |
| | 9 | 96 | 876 | 1620 - 2160 | 3060 | 5040 | 5580 |
| | 12 | 471 | Option | Option | Option | Option | Option |
| To start of intensive | | | | | | | |
| Year: | | N/A | Nil | Nil | Nil | Nil | Nil |
| At grade: | | 7 | 4 | 7 | 4 | K | K |

a. Grades 7, 8, 9 are junior high school; grades 10, 11, 12 are senior high school.

b. Different levels of French language arts are offered to meet needs of students from different French programs and some other subjects are taught in French as an option.

Montreal. Like the Ottawa area boards, the Montreal area Protestant boards tend to offer three programs -- core and kindergarten-entry and grade 7 entry immersion (Table 7). In addition to core, the Lakeshore Board offers a program that is enriched in grades K-3 and then offers 70 per cent French for at least three years. In the Protestant boards students have a choice of core or an immersion program in elementary school. At the secondary level (grade 7) they again have choices, often among a wide range of course options from a single course in French to 80 per cent of their program in French. At these boards different teachers teach the French and English parts of the program.

As might be expected, the immersion courses are popular. At the Lakeshore Board about 75 per cent of the students go into immersion at grade 4. At other boards from 35 to 50 per cent choose an elementary immersion program.

Mille Iles. In 1974 Mille Iles School Board initiated a program which was not an alternate form of immersion, but an alternate to immersion. The basic concept of immersion is that the student is put into an environment where he must use the second language or L2 (here meaning French for an anglophone) in order to communicate. Immersion stresses the functional use of the second language as a means of learning it. This has two advantages: first, that the student is exposed to French for many hours and, second, that he uses it in a "natural" way to communicate about something.

The Mille Iles approach, on the other hand, provides children with a short, intensive period where the language -- its structure and vocabulary -- is taught without reference to other school subject content. This intensive period is followed by a normal core-type maintenance program. The Mille Iles experiment was patterned after the "classes d'accueil" set up by the government of Quebec for immigrant children. Mille Iles simply applied the same principles to teaching anglophones.

TABLE 7

PER CENT OF TIME AND CUMULATIVE HOURS IN FRENCH OF ALTERNATIVE SECOND LANGUAGE PROGRAMS IN MONTREAL BOARDS

| Program | Southshore Core | Southshore Prim. Imm. | Southshore Late Imm. | Core[a] | PSGM Early Imm. | PSGM Late Imm. | PSGM Late Imm.[d] | Lakeshore Jr.Imm. | CECM Core |
|---|---|---|---|---|---|---|---|---|---|
| Per cent of time | | | | | | | | | |
| At grade: K | 13 | 100 | 13 | 10 | 100 | 10 | 10 | 20 | |
| 1 | 7 | 100 | 7 | 10 | 100 | 10 | 10 | 20 | 27 |
| 2 | 7 | 80 | 7 | 10 | 100 | 10 | 10 | 20 | 27 |
| 3 | 7 | 80 | 7 | 10 | 60 | 10 | 10 | 20 | 27[e] |
| 4 | 7 | 70 | 7 | 10 | 40 | 10 | 10 | 70 | 27[e] |
| 5 | 7 | 70 | 7 | 10 | 40 | 10 | 10 | 70 | 27 |
| 6 | 17 | 60 | 17 | 10 | 40 | 10 | 10 | 70 | 27 |
| 7[b] | 17 | 20-40[c] | 100[c] | 12 | 40 | 85 | 85 | 50-70[c] | 27 |
| 8 | 17 | 20-40 | 40 | 12 | 40 | 85 | 40 | 50-70 | 27 |
| 9 | 17 | 20-40 | 40 | 12 | 40 | 20 | 40 | 50-70 | 27 |
| 10 | 17 | 20-40 | 40 | 12 | 40 | 20 | 40 | 50-70 | 27 |
| 11 | 17 | 20-40 | 40 | 12 | 40 | 20 | 40 | 50-70 | 27 |
| Cumulative hours | | | | | | | | | |
| To grade: 6 | 1230 | 4570 | 1230 | 630 | 4230 | 630 | 630 | 2610 | 1440 |
| 8 | 1530 | 5290 | 2490 | 870 | 4950 | 2160 | 1755 | 3510-3870 | 1920 |
| 11 | 2080 | 6370 | 3570 | 1230 | 6030 | 2700 | 2835 | 4860-5400 | 2640 |
| To start of intensive | | | | | | | | | |
| Year: | N/A | Nil | 1230 | N/A | | 630 | 630 | 720 | N/A |
| At grade: | | K | 7 | | K | 7 | 7 | 4 | |

a. Core program at Lakeshore and Greater Montreal Boards.
b. High school starts in grade 7. Where two times are given students have options.
c. Students may opt for additional "post-immersion" courses - up to 80 per cent of program.
d. Phased out.
e. Alternate entry points.

The Mille Iles Board has tried two entry points. The early program consisted of regular kindergarten in English followed by a "grade 1" program which consisted of five months intensive French and five months of a regular grade 1 program. Evaluation indicated these children were superior in French skills to immersion comparisons who had had kindergarten and grade 1 in French (1350 hours). The second program puts children into the intensive program in grade 6 for three and a half months. It was found that these 11-year olds produced French that was syntactically superior to that of grade 6 children who had been in immersion since kindergarten. The Mille Iles Board prefers the grade 6 program because the late start eliminates the need for a lengthy French skills maintenance program through the elementary years.

The Mille Iles program is reminiscent of the Ottawa Board of Education Cultural Centre for Intensive French which was tried for several years in the early 1970's. The Mille Iles program differs from that, however, in being longer (three and a half months compared to two weeks), in taking whole classes and applying to all English program children (thus eliminating "overlay"), and in being a more structured language learning experience.

## III. LEARNING FRENCH: WHEN? HOW MUCH? HOW FAST?

Early research into immersion and other programs expanding the time allotted to French asked, first, what this would do to the learning of other subjects in the school curriculum, subjects that might be taught through the medium of French or might have smaller time allotments because of the increased time spent on French. Over the years, however, fears of losses have been allayed. Students in the various programs were shown to do as well, in the long run, as comparable students in regular program classes in all subjects, including English. As study after study replicated these results, research focused on the question of how much French is learned in different variations of immersion or bilingual programs.

### Time Allocations and French Learning

It had long been assumed that the amount of time devoted to a subject would determine, to a large extent, the amount of learning (Carroll, 1963). And, indeed, the massive amounts of French given in immersion programs were clearly resulting in greater French learning than the 20 or 40 minutes per day core programs. Immersion students were actually speaking the language by the end of grade 1.

However, this assumption was questioned after late immersion programs were introduced, perhaps to placate parents who wanted a chance for children who were already past the grade for primary immersion. These children, too, were taking only a year or two to speak French, reaching a standard in relation to their francophone peers which was comparable to the standard reached by primary immersion pupils in relation to the younger francophones. For example, Genessee and Chapman (1975), in examining a grade 7-entry immersion program, found the immersion students after one year performing

at stanines 3 or 4 (depending on type of school) in comparison with the francophone mean of 5. By grade 11 other students from the grade 7 entry program were perfcrming at stanine 5 or better when compared with francophones (Genessee, Allister and Morin, 1974).

About the time this evidence was coming out of Canadian schools, Clare Burstall had finished a study in England which examined the effects of starting a core French program in primary school rather than at the secondary level. Burstall (1974: 120-123) argues that there is no evidence that there is a "critical age" for learning language (as Penfield hypothesized) and that studies with "a high degree of precision and control" have tended to find that younger students learn more slowly than older ones.

> "Thus, the most conservative interpretation which available evidence would appear to permit is that the achievement of skill in a foreign language is primarily a function of the amount of time spent studying that language, but is also affected by the age of the learner, older learners tending to be more efficient than younger ones."

She indicates, furthermore, that the early advantages tend to fade over time as students who began to study a second language when "older" are exposed to several years of amounts of time in the language equal to students who began earlier.

The OBE French Project Results

Early results from the French Project, begun at the Ottawa Board of Education in 1973, seemed to support the contention that more time led to more French learning. Later results, however, tended to indicate that the relationship was a more complex one. Table 8 is a simplification of Table 3.3 from the Fifth Year Report of the French Project (Morrison, 1978). Comparison of time and mean scores within grade 9 and grade 10 seems to

TABLE 8

FRENCH LANGUAGE RESULTS FOR OTTAWA AND CARLETON BOARD STUDENTS IN SECONDARY BILINGUAL PROGRAMS, SPRING 1978

| Grade | Board | Program | Cum. Hours of French | Listening IEA IVS | | Reading IEA IVS | | Writing IEA IV | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Mean | N | Mean | N | Mean | N |
| 9 | OBE | 6-entry | 2595 | 19.6 | 54 | 19.9 | 66 | 22.4 | 62 |
| | CBE | 7-entry | 2115 | 18.2 | 66 | 18.9 | 66 | 26.5 | 67 |
| | OBE | 7-entry | 1755 | 17.9 | 22 | 18.1 | 28 | 20.3 | 28 |
| | OBE | 9-entry | 1095 | 16.7 | 21 | 16.4 | 24 | 18.3 | 24 |
| 10 | OBE | 6-entry | 3045 | 24.3 | 16 | 22.3 | 13 | 26.7 | 20 |
| | CBE | 7-entry | 2385 | 20.6 | 49 | 20.6 | 49 | 25.3 | 50 |
| | OBE | 7-entry | 2205 | 22.4 | 48 | 21.0 | 41 | 26.7 | 60 |
| | OBE | 8-entry | 1875 | 20.7 | 9 | 23.7 | 10 | 26.6 | 10 |
| | OBE | 9-entry | 1545 | 23.8 | 24 | 19.4 | 25 | 25.2 | 27 |
| 11 | CBE | 7-entry | 2655 | 24.9 | 24 | 25.9 | 22 | 28.2 | 22 |
| | OBE | 7-entry | 2655 | 28.2 | 16 | 25.8 | 15 | 28.8 | 17 |
| | OBE | 8-entry | 2325 | 25.6 | 40 | 24.7 | 44 | 28.7 | 45 |
| | OBE | 9-entry | 1995 | 25.7 | 25 | 23.2 | 29 | 27.4 | 28 |
| 12 | OBE | 8-entry | 2715 | 28.7 | 12 | 25.1 | 20 | 30.5 | 17 |
| | OBE | 9-entry | 2325 | 28.8 | 24 | 27.2 | 39 | 30.6 | 37 |

Source: Morrison, The French Project, Fifth Annual Report, Ottawa Board of Education Research Centre, 1978.

indicate that more time does, generally, lead to higher scores. These differences are most apparent in the measures of receptive skills and are less for writing. Furthermore, the relationship between time and scores tends to decrease over the grades, with almost no relationship for students in grade 12.

The most salient feature of this table, however, is the difference by grade: With few exceptions, the grade 12 students do better than the grade 11 students, who do better than the grade 10 students who, in turn, do better than the grade 9 students. Grade 10 students with 1500 and 3000 hours score

more like one another than do grade 9 students with 2500 hours and grade 10 students with 2300 hours. Thus, these results tend to support Burstall's contention that older learners are more efficient. These results are especially surprising since the range from "younger" to "older" in these scores is relatively short -- from grade 6 to 9 only.

These results also bring into question the idea that an effective immersion program had to introduce French with a fully French program. The three programs tested in Table 8 were: 100 per cent in the OBE 6-entry program followed by 50 per cent; 50 per cent throughtout for the OBE 7-, 8-, and 9-entry programs; and 80 per cent in grades 7 and 8 for the CBE 7-entry followed by about 30 per cent through high school. The high achievement of at least some cohorts in each of these programs indicated that a 100 per cent immersion year was not essential. Earlier research had indicated that partial immersion programs were less successful. Barik and Swain (1974), examining primary-entry students in Elgin County had found these lagging behind full immersion pupils in both French skills and English achievement skills. However, this seems to be an isolated result. Edmonton offers a 60 per cent bilingual program beginning at two levels, kindergarten and grade 4, and finds pupil progress satisfactory. Their English skills are comparable to those of matched controls. French skills were measured using a locally-constructed test which has not been administered elsewhere nor normed on a francophone population. All that can be said, therefore, about the Edmonton Public School Board French results is that they are satisfactory and the bilingual programs are continuing there. Edwards et al. (1981) found the Ottawa Roman Catholic Separate School Board bilingual programs producing less French learning than a full immersion program, but considerably more than an extended-core (60 to 75 minutes per day) French program.

The results of these studies, too, seem to indicate that the relationship between amount of cumulative French time, the proportion of a child's program in French, and the age of accumulating French instruction on the one hand, and French learning on the other, is, indeed, a complex one. However, before going on to examine the data from a variety of studies, some methodological considerations should be mentioned.

Methodological Notes

Originally, in undertaking this study, the writer expected to be able to make some direct comparisons across programs, described by entry point and time at different boards. It was realized that such comparisons would be tenuous, but thought that consistent results, if they were found, would indicate better and less desirable variations. If consistency in relation to time were not found, it was hoped that other aspects of the programs which might be related to learning results would be found. However, it became apparent immediately that direct comparisons across studies -- and, therefore, usually across boards -- cannot be made.

Tests: In the first place, a wide variety of tests were used by different researchers. Even where the "same" test was used by different researchers, often they gave different levels of the test to different (or the same) grades. Sometimes, also, the version of a test (e.g. the Test de rendement en français developed by La Commission des écoles catholiques de Montréal) given to the immersion students was a different level than would be used with francophones. Several reports failed to state what level of a test was being given. In other cases, the tests used in the research were being developed concurrently with the testing project, so that later cohorts received "revised" versions of the test given earlier cohorts. Clearly, there

is no way children in different programs can be compared if they were given different tests or levels of a test.

Research Designs: Furthermore, research designs differed so that testing was done at different grade levels for different programs. As already noted the steady increase in scores over grade levels is probably the most salient feature of the results whenever the same test is used for several grades. Thus, results from a comparison of two programs, using students at different grade levels, mix grade level effects with program effects (if any).

Other differences in design are sampling procedures and method of analysis. These issues, however, will be discussed below under "Cohort Variations."

Program Stage: Another consideration is the amount of a program completed at the time of the comparison. It hardly seems reasonable to compare a group of students who have had seven or eight years of a full K-entry immersion program with students in the first year of a late-entry program. The early-entry students have, in effect, completed the bulk of their program and are entering a maintenance phase, while the late-entry students are still in the intensive phase. For this reason, not only is grade level important, but the stage of the program -- whether the comparison is between a 75 per cent finished program with a 25 per cent finished program, or at the stage where both programs are 50 per cent or 100 per cent finished -- must be taken into account. Comparisons at the grade 12 (in Quebec, grade 11) level are especially interesting because all programs may be considered "finished" at this grade.

Cohort Variation: Last, but not least, of these methodological problems is the variation in scores between cohorts passing through the same program.

Table 9 illustrates the problem. Three cohorts of a grade 4 entry immersion program took the same test when they were in grade 6. Cohorts II and III were compared with francophone comparison groups. By chance (one presumes, although there may be some common reasons, e.g. a teacher strike or flu epidemics that made Cohort III miss more school) Cohort II has both the best experimental and the best control group, and Cohort III has the worst. Had it been the other way round, the results of tests of significance might have been somewhat different.

TABLE 9

LAKESHORE GRADE 4 ENTRY COHORTS SCORES ON TEST DE RENDEMENT EN FRANCAIS: GRADE 6

| Cohort | Score | S.D. | N |
|---|---|---|---|
| I | 16.53 | 9.56 | 40 |
| II | 19.11 | 5.03 | 67 |
| III | 11.81 | N/A | 83 |
| Francophone Comparisons | | | |
| II | 29.90 | 4.74 | 40 |
| III | 25.23 | N/A | 76 |

A more dramatic example comes from the Ottawa Board Research Centre's French Project. When core students moved from grade 6 to 7, most left elementary schools and moved to larger intermediate schools. Since, for administrative reasons, sampling was by classes, it was necessary to draw a new sample of classes. This was done by randomly selecting classes from representative types of schools in each of the two boards. The testing of this new grade 7 sample in each board yielded mean scores almost exactly

the same as those of the old sample in grade 6. Thus, the change in sample meant a different ability level (or, alternately, that students had learned no French at all in grade 7 -- a result not to be believed for both boards).

In addition to sampling variability and to random variability among cohorts, there is a systematic problem in that brighter children tend to opt for the more challenging programs. For most programs, the IQ of children choosing immersion is above that of children taking the "regular" program (see, for example, MacNab, 1979a). Where studies have looked at SES, this, too, favours the immersion or bilingual choosers. There are probably other differences. One study found that although the SES level of immersion and regular students was the same, the parents of immersion students were more apt to be in social service occupations, while the non-immersion parents were in business occupations (Samuels and Griffore, 1979).

To the extent that the immersion students tend to be brighter, there may also be a "hothouse effect": IQ differences may be enhanced by creating a different classroom environment. Immersion students are more likely to be in classes with only average and above average peers, while the non-immersion student is in a class with below average students as well. Thus, the immersion classroom may be a more stimulating one. As it is also a more homogeneous one, the teacher can more easily speed up the pace of teaching.

Research design can seldom fully compensate for these differences. When attention is directed to the problem, solutions by different researchers lack compatibility. One will use samples matched on IQ, age and SES; another picks classrooms from the same or socially comparable neighbourhoods, while a third controls statistically for measured differences. Furthermore, different IQ measures are used for control, thus again reducing comparability. The problem

of control for ability is also related to the tests used, since tests of reading, writing and other academic skills, like formal grammar and spelling, are more closely related to measured IQ than are the oral skills of listening and speaking.

These methodological problems mean that any attempt to make direct comparisons had to be abandoned. Furthermore, the methodological problems must be taken into account, as best as can be, when comparing the results of various studies. One thing the problems may do, however, is to make one more confident when the results of a number of studies are consistent. When consistency in findings is found, it is not likely due to similarity of methodology or of students.

Study Results

What, then, are the consistencies that are found in these studies?

Growth. The first, and most consistent, result is that the children in these French programs learn French over time. All longitudinal studies show the cohorts learning French. Comparisons of children at different grade levels in the same program show older students know more than younger ones. These results are expected and are so obvious, perhaps, as to scarcely be worth iterating. As we shall see, however, there are variations in the pattern of growth in French learning which can only be noticed when the general growth pattern is kept in mind.

We should note also that what we mean by learning over time is that the older students do better on various tests of French "learning." This ability to distinguish between older students with more exposure to a subject and younger students with less exposure is built into these tests through the selection of items that "discriminate." Therefore, not all of this "doing better" may be due strictly to learning in the French programs. Some may be

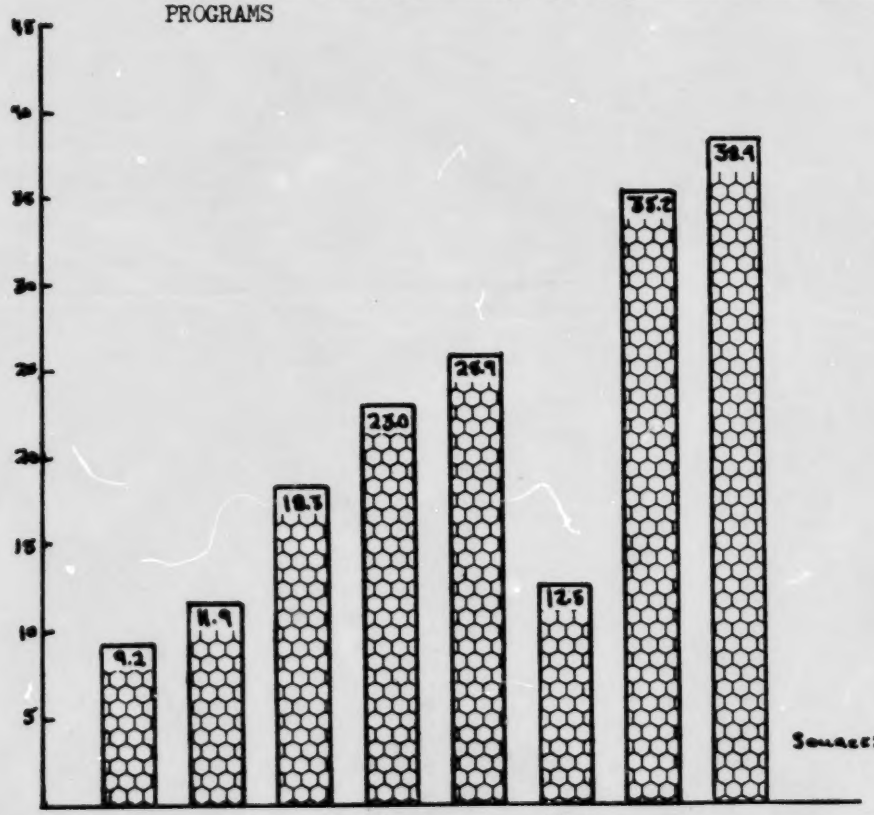
due to maturation or to a growing test wiseness (see Crehan et al., 1977). Furthermore, skills learned in English or other subjects may be transferred into French. Early studies of primary immersion talked enthusiastically of the "transfer" that occurred from French to English enabling anglophones who had been taught to read in French only to put those skills to use and read English. However, there is no reason to assume that "transfer" is a one-way street, and possibly one of the reasons for improvement in French test scores is transfer of English-learned skills to achieving well on the French tests.

Whatever the mechanism, the studies consistently show students in higher grades doing better than students below them.

Cumulative Time. The studies were also consistent in that there is a tendency for students who have received more French to do better than students who have had less French. There are exceptions as we shall see, but within grade levels those comparisons which reach significance are usually in this direction.

This tendency was noted in Table 8. Figure II (adapted from Edwards et al., 1977, with additions from Barik and Swain, 1975) clearly shows a strong relationship between amount of French and learning for young (grade 2) students. Table 10 shows results for a number of studies which have compared students in different programs at the same grade level. Again, there is a tendency for pupils who have accumulated more French, either because of a more intensive program or because of starting earlier, to do better than students with less total time. Tables 11 and 12 (which include the data from Table 8) also indicate a relationship between cumulative time and learning.

FIGURE II: MEAN SCORES ON THE OISE FRENCH LISTENING COMPREHENSION TEST LEVEL 1 OF GRADE 2 CHILDREN IN ALTERNATIVE SECOND LANGUAGE PROGRAMS


9.2
11.9
18.3
23.6
26.9
12.6
35.2
38.1
20 min/day - CBE Gr 2/3
N = 87; sd = 4.6
40 min/day - OBE Gr 2/3
N = 227; sd = 6.7
60 min/day - ORCSSB
N = 53; sd = 8.7
90 min/day - OISE sample
N = 57; sd = 9.1
150 min/day - ORCSSB
N = 61; sd = 5.9
150 min/day - St. Thomas
N = 19; sd = 2.9
300 min/day - ORCSSB
N = 70; sd = 4.6
300 min/day - OBE & CBE
N = 277; sd N/A

Source: Edwards et al., 1977; Barik & Swain, 1975.

TABLE 10

RESULTS OF COMPARISONS OF ALTERNATIVE FRENCH SECOND LANGUAGE PROGRAMS

| Board and Test | Grade level at time of testing | Comparison |
|---|---|---|
| Lakeshore | | |
| Test de lecture California | 8 | 4i > 7i |
| | 7 | 4i > 7i |
| | 6 | F > 4i(2) |
| Greater Montreal | | |
| Test de lecture California | 7 | Ki > F > 7u > c |
| Test de rendement en français | 7 | Ki > F > 7u > c |
| (CECM) | 11 | F > 7u > c |
| | 4 | F > Ki |
| | 9 | Ki = 7t = 7u > c |
| | 9 | F = Ki > 7t > 7u > c |
| Test de lecture (OISE) | 9 | 7t > 7u |
| Test de composition | 9 | F > Ki = 7t > 7u > c |
| | 9 | F = Ki = 7t > 7u > c |
| Lakeshore | | |
| Test de rendement en français | | |
| (CECM) | 8 | 4i > 7i |
| Ottawa-Carleton | | |
| IEA IVS French Reading | 9 | 6i > 7b > 8b > 9b = 7e |
| | 10 | 8b > 6i > 7b&e > 9b |
| | 12 | 7b > 6i = 7e > 9b |
| | 9 | 6i > 7e > 7b > 9b |
| | 10 | 6i > 7e > 7b |
| | 11 | 7b&e > 8b > 9b |
| IEA IVS Listening Comprehension | 12 | 8b > 7b > 9b > 7c |
| | 9 | 6i > 7e&b > 9b > 8b |
| | 9 | 6i > 7e > 7b > 9b |
| | 10 | 6i > 7e > 7b |
| | 10 | 6i > 9b > 7b > 8b = 7e |
| IEA IV French Reading | 8 | Ki > 6i > 7e |
| Test de mots à trouver (OISE) | 8 | Ki > 7e > 6i |
| | 8 | Ki > 6i = 7e |
| | 12 | 8b > 7e&b > 9b |
| | 12 | 7e > 7b > 6i > 9b |
| LKE 400 B Speaking (Fed. Pub. | 12 | 8b > 9b |
| Service) | 12 | 8b > 9b |
| Lakeshore | | |
| "Communications" Test (Oral) | 5 | 4i > c |
| ORCSSB | | |
| French Comprehension Test 1 (OISE) | 1 | Ki > Kb > Kc |
| IEA Reading | 4 | Ki > Kb > Kc |
| IEA II Listening | 4 | Ki > Kb > Kc |
| Test de rendement en français (CECM) | 4 | Kb > Ki > Kc |
| IEA IVS Reading | 8 | Ki > 7i > 1x |
| Mots à trouver, Niveau 7 (OISE) | 8 | Ki > 7i > 1x |
| Test de rendement en français (CECM) | 8 | Ki > 7i |



see key on the next page

TABLE 10 - Continued

Key

* b - bilingual (50% French) program

c - core - 20 to 40 min/day French

e - 80% French in grade 7 and 8; 30% thereafter

F - Francophones (comparison group)

i - immersion (usually 100% to 80% French for 2-3 years, then decreasing)

K - Kindergarten-entry

t - two year 85% in grades 7 and 8, followed by 20%

u - one year 85% in grade 7, followed by 40%

x - extended program (60 - 100 min/day French)

Numbers indicate grade level an immersion or bilingual program began.

TABLE 11

MEAN SCORES OF LATE-ENTRY IMMERSION GROUPS
ON IEA IVS LISTENING COMPREHENSION TEST

| Program | Cohort | End of Grade 9 | 10 | 11 | 12* | 13* |
|---|---|---|---|---|---|---|
| Bilingual high school rom French schools | A | | | | 34.0 | |
| | B | | 31.4 | | | |
| | C | | 27.9 | 33.5 | 32.7 | |
| | D | 29.2 | 32.0 | | | |
| | E | 24.6 | | | | |
| | F | | 29.0 | | | |
| Midpoint of range | | 26.9 | 29.9 | 33.5 | 33.3 | |
| Cumulative hours | | | | | | |
| Grade 6 entry: 100% ollowed by 50% | 1 | 22.2 | 24.3 | | | |
| | 2 | 19.6 | | | | |
| | 3 | | 24.3 | | | |
| Midpoint of range | | 20.9 | 24.3 | | | |
| Cumulative hours | | 2595 | 3045 | | | |
| Grade 7 entry: | 1 | | 23.6 | 28.2 | 28.3 | |
| Bilingual (50%) | 2 | 17.7 | 22.4 | | | |
| | 3 | 17.9 | | | | |
| | 4 | | 22.6 | | | |
| Midpoint of range | | 17.8 | 23.0 | 28.2 | 28.3 | |
| Cumulative hours | | 1755 | 2205 | 2655 | 3105 | |
| Grade 7 entry: | 1 | | 24.3 | 24.9 | 24.5 | |
| 80%, 80%, followed | 2 | 17.6 | 20.6 | | | |
| by 30% | 3 | 18.2 | | | | |
| | 4 | | 19.5 | | | |
| Midpoint of range | | 17.9 | 21.9 | 24.9 | 24.5 | |
| Cumulative hours | | 2115 | 2385 | 2655 | 2925 | |
| Grade 8 entry: | 1 | | 25.4 | 26.8 | 28.7 | |
| Bilingual (50%) | 2 | | 22.8 | 25.6 | 29.2 | |
| Midpoint of range | | 14.6 | 23.0 | 26.2 | 28.9 | |
| Cumulative hours | | 1425 | 1875 | 2325 | 2775 | |
| Grade 9 entry: | 2 | | | 28.0 | 30.7 | 29.8 |
| Bilingual | 3 | | 21.0 | 23.8 | 28.8 | |
| | 4 | | 22.2 | 25.7 | 25.8 | |
| | 5 | 16.3 | 23.8 | | | |
| Midpoint of range | | 16.5 | 22.4 | 25.9 | 28.2 | 29.8 |
| Cumulative hours | | 975 | 1425 | 1875 | 2325 | 2775 |

Source: The French Project Annual Reports, 1976-1980, OBE Research Centre.

*Small N's in these grades mean that the sample is substantially different from earlier grades.

TABLE 12

MEAN SCORES OF LATE-ENTRY IMMERSION GROUPS
ON IEA IV FRENCH WRITING TEST

| Program | Cohort | End of Grade 8 | 9 | 10 | 11 | 12* | 13* |
|---|---|---|---|---|---|---|---|
| Bilingual high schools from French schools | A | | | | | 34.7 | |
| | B | | | 33.1 | | | |
| | C | | | 29.9 | 32.0 | 34.9 | |
| | D | | 28.1 | 31.3 | | 34.3 | |
| | E | | 28.9 | | | | |
| | F | | | 32.4 | | | |
| Midpoint of range | | | 28.5 | 31.5 | 32.0 | 34.6 | |
| Grade 6 entry: 100% followed by 50% | 1 | 15.4 | 21.2 | 26.7 | | 26.8 | |
| | 2 | | 22.4 | | | | |
| | 3 | | | 26.1 | | | |
| Midpoint of range | | 15.4 | 21.3 | 26.4 | | 26.8 | |
| Cumulative hours | | 2145 | 2595 | 3045 | 3495 | 3945 | |
| Grade 7 entry: Bilingual (50%) | 1 | | 21.0 | 26.3 | 28.8 | 31.0 | |
| | 2** | | 19.5 | 27.2 | | 28.7 | |
| | 3 | | 20.3 | | | | |
| | 4 | | | 26.8 | | | |
| Midpoint of range | | | 20.2 | 26.7 | 28.8 | 29.8 | |
| Cumulative hours | | | 1755 | 2205 | 2655 | 3105 | |
| Grade 7 entry: 80%, 80%, followed by 30% | 1 | | 23.1 | 26.3 | 28.2 | 30.0 | |
| | 2** | | 21.9 | 25.3 | | 30.9 | |
| | 3 | | 26.5 | | | | |
| | 4 | | | 28.1 | | | |
| Midpoint of range | | | 24.2 | 26.7 | 28.2 | 30.4 | |
| Cumulative hours | | | 2115 | 2385 | 2655 | 2925 | |
| Grade 8 entry: Bilingual (50%) | 1 | | | 25.0 | 26.5 | 30.5 | |
| | 2 | | 17.7 | 25.4 | 28.7 | 30.9 | |
| | 3 | | 20.1 | 26.6 | | | |
| Midpoint of range | | | 18.9 | 25.8 | 27.6 | 30.7 | |
| Cumulative hours | | | 1425 | 1875 | 2325 | 2775 | |
| Grade 9 entry: Bilingual | 2 | | | | 27.3 | 29.5 | 34.1 |
| | 3 | | | 21.1 | 25.5 | 30.6 | |
| | 4 | | 18.3 | 24.2 | 27.1 | 29.5 | |
| | 5 | | 17.7 | 25.2 | | 27.1 | |
| | 6 | | 18.3 | | | | |
| Midpoint of range | | | 18.0 | 23.1 | 26.4 | 28.8 | 34.1 |
| Cumulative hours | | | 975 | 1425 | 1875 | 2325 | 2775 |

** Means come from subsample of same students throughout.
* Small N's of these grades mean that the sample is substantially different from earlier grades.

Source: The French Project Reports, 1976-1980, OBE Research Centre.

Although the general tendency is for more time to lead to greater learning, there are anomalies. The tendency for differences to decrease in later grades, noted with respect to Table 8, is also apparent in Tables 11 and 12. With the exception of students in the 80 per cent grade 7 entry program (7e), all these students were in the same bilingual high school, taught by the same teachers. It may be that teachers' demands for achievement gradually took precedence over amount of school time for these students. The low relative performance of the 7e group on listening comprehension in relation to their high relative performance on the writing test may also be indicative of curriculum differences.

In Table 10 we also note that the Greater Montreal kindergarten-entry immersion (Ki) out-performed native speakers in grade 7. Two factors may explain this anomaly. The Ki group were students of average and above average ability, while the francophone group contained a wider range of ability, and the tests were academic type tests where measured ability is a particularly good predictor of outcomes. The ability of later cohorts to catch up on academic tests is shown even more clearly by the results in grade 9 comparing early and late immersion.

Differences among cohorts are also fairly large, as shown in Tables 11 and 12, as well as on cohort data (from Barik and Swain, 1974a, 1975, 1976; Andrew, Lapkin and Swain, 1980). On the OBE data for three or four cohorts at grade 10, variations among cohorts within a program are often greater than the variations in midpoints of range among programs, especially on listening comprehension.

Considering these anomalies and the relative difference between the increase in scores by grade and the increases in scores related to time,

what can be said about the strength of the influence of cumulative time on French learning?

In terms of comparisons, these results seem to indicate that fairly large proportional differences in time are necessary before differences in learning attributable to time become reliable (over other effects such as cohort variability or curriculum expectations) and large enough to be important educationally. The data in the OBE studies and in Edwards (1977) suggest that when program B gives about twice as much French as program A, the difference in learning favouring B will be reliable and noteworthy.

In terms of actual numbers of hours, one must also consider grade level. In the secondary grades, Program A students in a lower grade (say, grade 10) must have accumulated at least 1000 more hours French than program B students in grade 11 to approach their level of proficiency on the tests used in these studies. How much greater than 1000 hours is hard to guess from these data, but they suggest that it probably is 2000 hours or more. That is, for student groups at the grade 10 level of a program to consistently do as well as student groups at the grade 11 level of an alternate program, the grade 10 students probably need to have received about 2000 or more hours of French than the grade 11 students.

It should be noted that we speak here of total amount of time irrespective of how that time has been accumulated. That is, it does not seem to matter whether the program is immersion or bilingual so long as the time is accumulated.

Maintenance. That statement probably must be tempered by the concept of the maintenance of earlier learning. The studies did not test children who "graduated" from a program (a very different group than children who "dropped out" of French programs) so there is little evidence on this point. However, again there are some hints in the data that maintenance of French skills is necessary.

One hint is the score of the 80% grade 7 entry students on the test of listening comprehension (Table 11). These students received only 270 hours of French (at most) throughout high school. Furthermore, their high school curriculum seemed to emphasize written rather than spoken French. Their scores dropped in relation to other groups on the comprehension (but not writing). Genessee, Allister and Morin (1974a) also report a significant difference in listening comprehension between grade 7 entry immersion students who are and are not taking French in grade 11, favouring students currently studying French. These students also tend to do slightly better on an oral production test, although the result are not significant.

More evidence is needed on what happens when students who are successful in a program complete it, and discontinue or greatly reduce their French studies. Comparison of Greater Montreal's 7u and 7t groups (see Table 10) in grade 11 will be particularly interesting in this respect (see Genessee, 1979). The small amount of information available is consistent with the need for maintenance in the area of listening comprehension, but that is the most that can be said at this time.

Starting Age. Although the grade level at which a program starts is a defining characteristic of the programs considered in this report, the effects of starting in grade 9 or 6 or 5 or kindergarten are often very difficult to separate from the accumulation of very different amounts of time in French depending on the starting age.

The important finding in regard to starting age is that grade level effects are stronger than cumulative time effects. The corollary of this is that students who started at later grades require only a couple of years to

be performing more like different-program students who started earlier than like same-program students who are a year or two older. Edwards et al. (1977) compared students in grade 6 who had followed a full immersion program (4780 cumulative hours) with students in grades 7 and 8 who had followed an extended program in kindergarten through grade 6 (60 to 75 min/day) and a 75 per cent immersion in grades 7 and 8 (approximately 2000 hours in 7 and 2675 in 8). The 99 grade 6 students scored 20.8 (SD 6.9) on the OISE Test de lecture in comparison with 15.4 (SD 6.0) for the 45 grade 7 immersion students and 23.1 (SD 7.9) for the 38 grade 8 students. Ottawa researchers compared grade 8 students from kindergarten-entry immersion with those from two late-entry immersion programs (6 entry and 7 entry) and found that in writing 20-minute essays the early immersion students wrote about 20 per cent more words and made an average of 3.3 fewer errors per 100 words. Differences between the students at the two boards were of about the same order of magnitude as differences between late- and early-entry programs (Morrison, 1979, 1980). Differences on OISE Test de mots à trouver give similar results: 19.5 for the early immersion, 17.1 for the late immersion groups. The early immersion students at the grade 8 level obtained scores on this test similar to those of late-entry immersion students at the grade 10 level.

The comparison in grade 9 of grade 7 entry and kindergarten-entry immersion students in Greater Montreal also clearly shows the ability of late entrants to catch up (Genessee, 1979). Differences between different starting ages were over-shadowed by differences between the two grade 7 entry programs.

This year, for the first time, the Edmonton programs will be comparing students at the same grade in their grade 4 a[illegible] kindergarten-entry bilingual programs. In their 1980 report, however, they compared kindergarten-entry,

grade 4 entry and grade 7 entry students who were, respectively, in grades 5, 6 and 9. Except on listening comprehension, at the grade 9 level those who had entered at grade 7 performed significantly better than either the kindergarten or grade 4 entry students. The latter two groups performed equally well. The grade 4 entrants out-performed the other two groups on listening comprehension (Edmonton Public Schools, 1980a. See Table 13).

TABLE 13

COMPARISON OF FRENCH LANGUAGE SKILLS SCORES OF EDMONTON STUDENTS IN GRADE 5 BILINGUAL, GRADE 6 INTERMEDIATE IMMERSION AND GRADE 9 LATE IMMERSION PROGRAMS

| French Language Skills and Program | n | Mean | Standard Deviation | F Ratio | Significant difference between groups |
|---|---|---|---|---|---|
| Reading Comprehension (max.=35) | | | | | |
| Bilingual Program, gr. 5 | 110 | 19.1 | 7.2 | | |
| Intermed. Immer. gr. 6 | 64 | 19.5 | 8.3 | 11.1* | BP,IIP < LIP |
| Late Immersion gr. 9 | 19 | 27.7 | 4.4 | | |
| Listening Comprehension (max.=28) | | | | | |
| Bilingual Program, gr. 5 | 110 | 16.7 | 4.8 | | |
| Intermed. Immer. gr. 6 | 64 | 18.5 | 3.7 | 4.7** | BP,LIP < IIP |
| Late Immersion gr. 9 | 19 | 15.6 | 3.4 | | |
| Oral Expression (max.=31) | | | | | |
| Bilingual Program, gr. 5 | 110 | 22.7 | 4.8 | | |
| Intermed. Immer. gr. 6 | 63 | 22.2 | 4.4 | 3.7** | IIP < LIP |
| Late Immersion gr. 9 | 19 | 25.4 | 4.2 | | |
| Written Expression (max.=35) | | | | | |
| Bilingual Program, gr. 5 | 110 | 17.7 | 5.2 | | |
| Intermed. Immer. gr. 6 | 63 | 16.7 | 5.6 | 10.6* | BP,IIP < LIP |
| Late Immersion gr. 9 | 19 | 23.1 | 5.1 | | |

* $p < 0.01$
** $p < 0.05$

Note: The last column designates groups that are significantly different from each other at the 0.05 level.
BP - Bilingual Program
IIP - Intermediate Immersion Program
LIP - Late Immersion Program

Thus, although there are consistent differences which favour the early immersion students, these are small. Within two or three years the late entrants have nearly caught up with the early starters -- they are, at the very least, playing in the same league.

Dosage. How much French per day? The pioneer immersion program in St. Lambert, after some experimentation, opted for 100 per cent in kindergarten, grade 1 and grade 2; 80 per cent in grades 3, 4 and 5; and then about 50 per cent. This seemed to work and many boards have simply followed suit. Even late-entry immersion programs tend to start with 75 to 100 per cent programs for a year or two. After building up the L2 skills time for French tends to taper off -- often to 50 per cent or even less.

Such an approach was supported theoretically by Cummin's threshold hypothesis. Cummins (1978) argued that the child must master the language of instruction to the point that he can cope with the concepts and cognitions appropriate to his age group if the child is not to be cognitively harmed by an immersion experience.* Thus, the child needs to pick up L2 skills rapidly to gain the ability to cope quickly.

The idea that a period of immersion was needed to develop skills quickly was supported by data from a partial bilingual program in Elgin County where the students in the program appeared to lag behind their English controls in English and behind immersion students in French (Barik and Swain, 1974b). Studies of other bilingual programs failed to replicate the Elgin County findings which may have been due to what we have called cohort variation.

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* Cummins has since elaborated the hypothesis to include 1) an upper threshold mastery of which leads to cognitive enhancement, and 2) a need for mastery of mother tongue as a prerequisite for second language learning. See Cummins, 1978. (For a cautionary note, see also MacNab, 1979b.)

The Ottawa Board's grade 9 entry bilingual program has proved successful over a series of cohorts. By grade 12 they perform as well as students entering earlier with larger doses of French. (Morrison, 1976, 1977, 1978, 1979, 1980). In Edmonton bilingual programs (60 to 70 per cent French) starting in kindergarten and in grade 4 are both deemed successful, as is a grade 7 entry 60 per cent immersion. Edmonton also has bilingual programs (kindergarten-entry) in Ukrainian and German which are continuing. In Ottawa, the separate schools initiated a bilingual program replacing their immersion program. Research by Edwards (1980) indicates the French skills of children in the bilingual program are more like those of immersion students than like those of the English controls. Figure II shows results for grade 2, and the difference between the bilingual students and the controls seems to have widened by grade 4.

The program at Mille Iles also relates to dosage since it indicates that a shorter, intensive program of strictly language study may produce learning equal to that of longer immersion programs where the language is learned by using it as a medium of instruction. If nothing else, the Mille Iles program reminds us of the importance of the content of the curriculum -- its expectations of what is learned, how fast and how thoroughly (Billy, 1980).

There seems to be no definitive answer to the question of how much French should be given at a grade level. Although there is a relationship between time and learning, as discussed earlier, it also seems that the bilingual programs do lead to considerable French learning without harm to English skills.

A Hypothesis

What we have found is that there is a clear growth in French learning scores by grade; that while time makes a difference, late starters in immersion with less French very nearly catch up to earlier starters in immersion; that the "dosage" of French matters only in terms of accumulating time and may be almost cancelled by curriculum demands and student ability. Is it possible to make sense of these findings in a theoretical framework? It seems to be.

First of all, the grade by grade improvement made in all programs is expected. On most tests we expect older students to do better than younger. Indeed, most "tests" have different versions, increasing in difficulty for older students. At the younger grades there is no single test that could be used for five successive grades. Where tests are given to several grades, we expect the mean score to increase over grades. Bloom (1974) reports that on standard achievement tests where the top 20 per cent of students reach a criterion level on first testing, 50 per cent reach that level a year later and 80 per cent have done so within two years. This pattern is normally ascribed to "learning," in turn related to ability (Bloom, 1974). The learning may also be related to maturation or developmental growth as in passing through Piagetian stages; to increased test wiseness, which is also possibly developmental (Crehan et al., 1977); or to a sequential presentation of curriculum material. Each of these factors must be considered in developing a hypothesis relating time to learning of French.

The first assumption to be made in developing an explanatory hypothesis is that children, from birth to the end of high school (at least), go through some developmental sequence such that they are able to cope with increasingly

complex ideas. It is not necessary to say this scheme of development has been described by any school of psychology, or that there are "stages" or "plateaus." All that is necessary for the hypothesis is that children in earlier grades are generally incapable of understanding concepts and their relationships that students in later grades are generally capable of understanding and using and that this understanding comes slowly with the more complex ideas being absorbed later. Note also that this developing capacity is a potential, and usually must be cultivated to become knowledge. This assumption is the basis for the increasing complexity of standard achievement tests.

The second assumption to be made is that the increase in understanding is paralleled (whether led or leading is moot) by a development in language -- both vocabulary and syntax -- that enables children to communicate the increasingly complex ideas (Chomsky, 1969). Thus, we find that both curriculum and tests of first language achievement start with simple vocabulary and structures for the early grades and move on to more complex words, ideas and structures. This development is true for all children. However, the more able children move through the sequence at a faster rate. This is one definition of ability.

Based on these assumptions, one can hypothesize that second language learning goes through two phases. In the first phase, the student learns the vocabulary and structures in the second language appropriate to express concepts and relationships which he already knows and can express in his first language -- this is, he merely learns a new code for old ideas.

In the second phase, he learns second language and first language in the same way, developing the increasingly complex ideas and understandings in partnership with the learning in both languages of the new vocabulary and structures which express them. In this phase, second language learning is much like first language learning. The speed with which either is mastered depends on the speed with which the student learns to cope with increasingly complex ideas. This development or maturation is sequential, and takes time, although it is more rapid in students of higher ability, slower in students of less ability.

Note that in both phases the speed of learning the second language depends on opportunity to learn; the vocabulary and structures the learner needs to express himself must be taught, or available in some way, and the learner must have the time needed to learn. Motivation and ability will also affect speed of learning in both phases. These are the prerequisites mentioned by Carroll (1963).

A corollary of the hypothesis is that beginning language learners (phase one) are more "efficient" since they have cognitions to fit words to. A second phase learner must learn both the underlying understandings and the language. The proportion of phase one and phase two learning varies with the age of the beginning student. For an infant learning two languages from the time he learns to talk, there would be virtually no phase one "second" language learning -- it would be all phase two. For an adult beginning to learn a second language, the learning would primarily be phase one, although there are always concepts that are almost non-existent in some languages and cultural modes of thinking that are essential to using the second language

and acquiring these would be phase two learning. Thus, older L2 learners are more efficient because they have more phase one learning.

There is, however, no clear break for a person learning a language between phase one and two.* Rather, in the beginning the school child tends to learn structures in the second language that parallel those he has in his first language and for which he already has formed the understandings. As he becomes more proficient in the language, as he comes to use it to communicate, then he learns through the language and the language grows for him along with his understanding. At this time, both phase one and phase two learning take place concurrently. As his mastery of the language becomes nearly complete, that is, more native-like relative to his age, he has learned those structures and that vocabulary necessary to express his ideas. At this time, most new learning in the second language, as in the first, will express the more complex cognitions that are developing concurrently with the language learning.

Figure III illustrates this learning model. First, the top diagonal line shows the learning of the native speaker. His (first) language skills are improving in keeping with his cognitive development. The two curved solid lines represent the second-language learning of students in an immersion program. Both groups go through a process of rapidly learning the second language structures and vocabulary appropriate to their cognitive level -- approaching the skills of a native speaker at their grade level.

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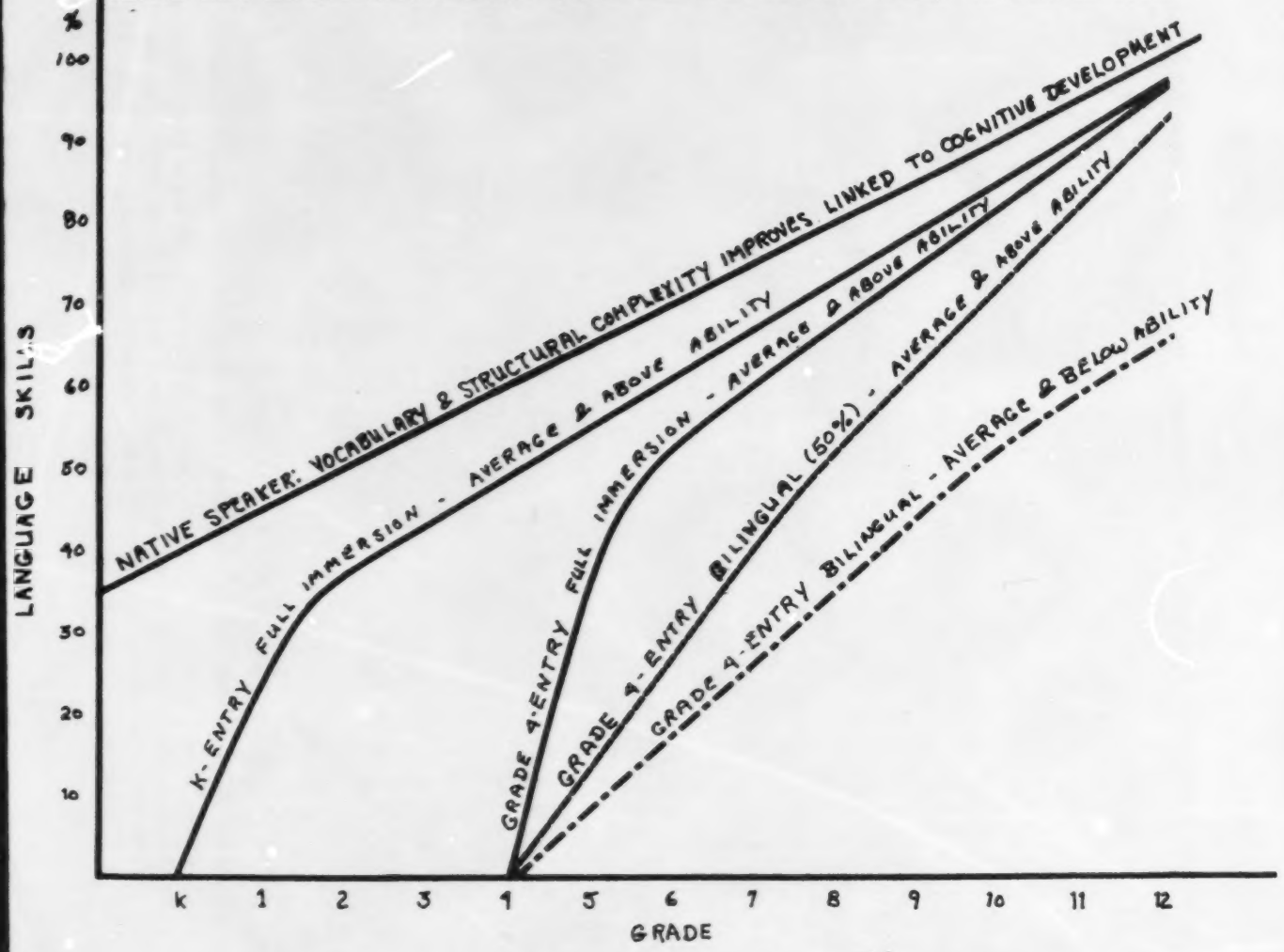
* The terms "phase one" and "phase two" have been used as a convenience. The only difference between them is that phase two is linked to the development of cognitive processes and structures, vaguely defined. In phase one learning, the cognitive development has taken place in advance of the second language learning.

FIGURE III: HYPOTHESIZED LEARNING CURVES ASSUMING 'NATIVE SPEAKER' CURRICULUM GOALS



Note, however, that for the students starting immersion later this first phase encompasses more structures and vocabulary because they already have more complex understanding for which they need only learn the new code. Younger students learn less of the L2 structures and vocabulary before they reach the phase where L2 learning must wait on their cognitive development.

The dashed line indicates what may happen when the program is bilingual (50 per cent L1 and 50 per cent L2) rather than full immersion (100 per cent L2). Phase one learning is slower because of less time (and possibly because the curriculum introduces L2 structures more slowly) and the transitional period from phase one to phase two is longer.

The dot-dashed line introduces the factor of ability. Lowering of the ability level acts very much like a reduction in time; the low ability students take longer to learn the phase one material and to develop the complex thinking that is part of phase two learning. The hypothesized curve for low ability students in a full immersion program would be close to that of above-average students in the bilingual program, although probably rising more slowly during the second phase.

In this discussion we have tacitly made a third assumption -- that the vocabulary and structures taught in the immersion (or other L2) curriculum were the same as those which native speakers would be learning, or, during the second language learners' phase one, those that the native speaker would be expected to know.* That is, we have assumed that the

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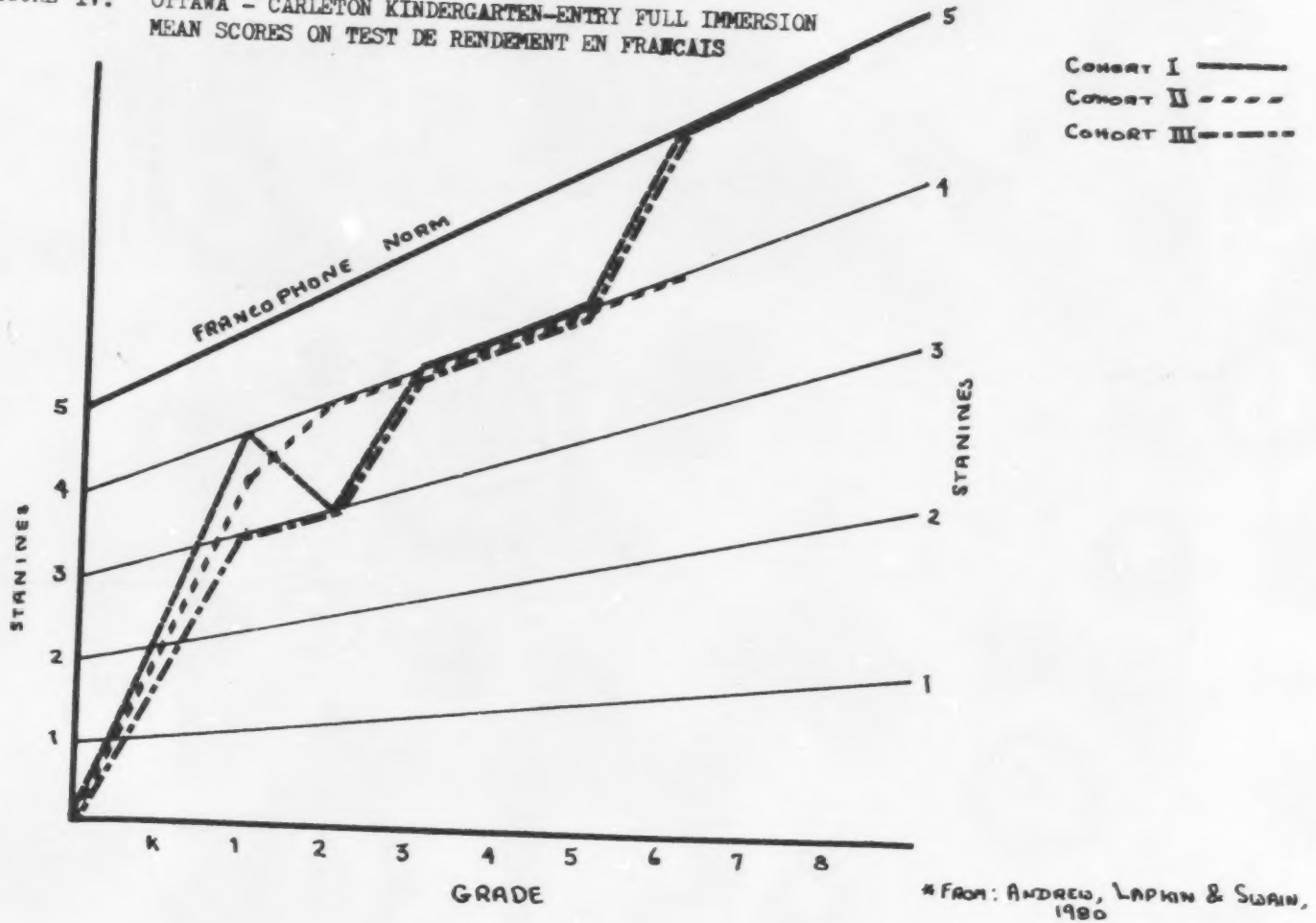
* Several researchers have reported that the second language learner acquires structures in the same developmental sequence as native speakers (d'Anglejan and Tucker, 1975; Cooper et al., 1979). However, there seems to have been no attempt to ascertain whether this "developmental" process coincided with the curriculum sequencing or not. It seems likely that generally second language teaching proceeds from simpler to more complex structures. If so, the "development" of the adult second language learners may simply reflect the sequence of exposure.

L2 learner has an opportunity to learn the L2 structures appropriate to his Francophone peers. If, instead, the curriculum for the L2 learner introduces concepts more slowly, the curriculum itself will act as the "ceiling" for L2 learning, taking the place of the francophone norms but at a lower level of skill. Thus, when Burstall says that the students who have had primary French "were in the same secondary schools and, most frequently, in the same classes," as students who had no primary French, we assume that the experimental primary group did not have the opportunity to build from their primary experience, but rather were offered, at first, structures already learned and after that shared new learning with others in their class.

How well do the data fit the hypothesis? At the present time we can only say that the available data are consistent with it. The evidence for development of language skills, both L1 and L2, as children mature is very strong. The evidence from the data presented here that beginning students, of whatever age, in immersion programs learn quickly is also compelling.

Figure IV reports on three cohorts of kindergarten-entry students in Ottawa-Carleton schools (Andrew, Lapkin and Swain, 1980). These students received approximately 100 per cent of their half-day kindergarten, 100 per cent of grade 1, 80 per cent of grades 2 to 4, 80 to 60 per cent of grade 5 and 50 per cent of grades 6 to 8 in French. The graph shows stanine scores based on the CECM norms. The fifth stanine is defined as the Francophone average. This stanine has been shown rising at the same rate as the "native speaker" norm in Figure III to represent the fact that the tests increase in difficulty. The other stanines rise to maintain the same proportional relationship between them.

FIGURE IV: OTTAWA - CARLETON KINDERGARTEN-ENTRY FULL IMMERSION
MEAN SCORES ON TEST DE RENDEMENT EN FRANÇAIS




* FROM: ANDREW, LAPKIN & SWAIN, 1980

Although the cohorts differ somewhat, the general pattern is that hypothesized. A second comparison may be made between the grade 9 entry bilingual program and the grade 6 entry program (100 per cent immersion in grade 6, followed by 50 per cent) at the Ottawa Board. Figure V shows scores for the grade 9 entry bilingual cohorts and compares these with students who, while currently at the bilingual high school, attended French elementary schools. These students set our "native speaker" norms. The lines trace the midpoints of the range of mean scores for several cohorts. As is apparent, the bilingual high school students generally conform to the hypothesis, rising quickly towards the "French norm" in the early part of their

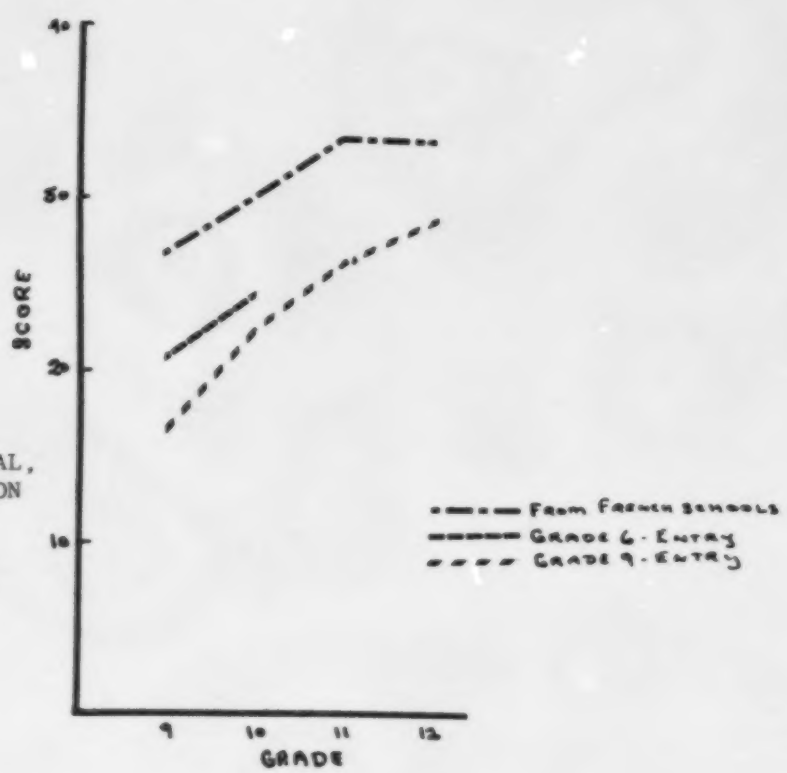



FIGURE V

SCORES FOR GR.9 ENTRY BILINGUAL, GR.6 ENTRY IMMERSION AND STUDENTS FROM FRENCH SCHOOLS ON IEA IVS LISTENING COMPREHENSION TEST

immersion experience and more slowly in the later years. The grade 6 entry students begin at a higher level and rise more slowly, as is to be expected. However, this test was not given to grade 6 entry students after grade 10.

Further longitudinal data to test the hypothesis are not available at this time. The evidence from cross-sectional studies is consistent with the hypothesis. Until more data, especially from longitudinal studies, is available, the hypothesis remains speculative.

## IV. SUMMARY AND DISCUSSION

The first section of this paper looked at French language programs available and researched. Immersion programs and other intensive programs are widely available in Canada as a means of learning French as a second language. The most common programs -- more than three-quarters of the total reported outside Quebec -- are primary-entry programs with two or three years of 80 to 100 per cent French followed by increasing proportions of English (to 40 or 50 per cent) during the remainder of the elementary years. The next most popular variety of immersion begins in the "middle years," grades 6 to 8 (grade 7 is the most common entry point), which accounts for another 14 per cent of the programs. Only 7 per cent of the 125 boards reported to have immersion in 1979-80 had no primary-entry program. One board reported an alternative to immersion: an intensive three-and-a-half-month French language learning period in grade 6.

Programs at the secondary level are not yet well developed, in part because most boards do not yet have elementary immersion students graduating into this level. However, there seems to be some recognition that French language options at this level are necessary to maintain and consolidate earlier gains.

The second part of the paper was concerned with what research into various programs had to tell the French program planner about what programs might be most effective. What is the best age to start programs? How many hours of French are necessary? How should this time be allocated?

We found, in the first instance, that these questions could only be understood against the basic pattern of year-to-year learning that takes place in all school subjects. Piaget, Erikson, Parsons and other theorists

have noted that children grow, resolving problems through increasing the complexity of their understanding. Carol Chomsky (1969) and others have found a similar development in children's comprehension and use of their mother tongue. Within school systems similar assumptions are made about children. Both the curriculum and the instruments designed to evaluate learning gradually increase over the years in the complexity and detail of the structures children are expected to understand.

In French learning, too, this pattern of growth is clearly present. Longitudinal studies of cohorts show children learning over the grades and comparisons across programs indicate that very large increases in time spent in L2, probably as much as twice as much, are necessary before students of equal ability will do as well as students in the next higher grade on the same test.

When students at the same grade level are compared, the results do support the contention that more time leads to more French. Again, however, it was noticed that the differences in total or accumulated amounts of L2 time had to be quite large for differences in learning to be reliably related to time. For students entering immersion in grades 6, 7, 8 or 9 and having programs of either 50 per cent French throughout, a single initial year of 100 per cent French or two initial years of 80 per cent French followed by a bilingual or partial French: 1) variations in test scores among cohorts in each program were almost as great as variations between programs; 2) there was variation among programs depending on the skill tested; and 3) students from different programs in the same bilingual high school environment seemed to grow more like one another over time.

Thus, although amount of time is one factor influencing amount of learning, it is clearly not the only factor and is a very "gross" factor -- that is, it takes a large difference in time to make a fairly small, but reliable, difference in learning.

The influence of "starting age," the grade at which children begin an intensive French learning experience, is difficult to determine from these studies because, in all cases, the earlier the starting age, the more cumulative time. However, the evidence strongly suggests that starting age is not important. Recently, kindergarten-entry cohorts have reached grade levels where they can be compared with late-entry groups, and differences between students in the two programs, although reliably present, are not great. Generally, the early-entry students perform about as well as late-entry students one grade older, and not quite as well as students two grades older.

Such a difference must be weighed keeping in mind pervasiveness and salience of year-to-year learning growth throughout the school system. It may, therefore, be an important achievement. However, this achievement must also be weighed keeping in mind two other facts in the equation: 1) the early-entry students have nearly always had <u>at least</u> twice as many hours of study in French (e.g., 5000 or 6000 hours compared with 2500 to 3000 hours), and 2) the difference is about the same whether one compares the kindergarten-entry with a grade 4 entry or a grade 7 entry. Thus, the chief value of starting age, in terms of test scores measuring French proficiency, may simply be that more hours can be accumulated.

In terms of "dosage" of French or allocation of total time by year, there is a clear preference among program planners for either a large initial

dose followed by a somewhat smaller maintenance dosage (at least 20 per cent, but usually 40 to 50 per cent); or for a constant 60 per cent or 50 per cent program. The former is clearly the most popular. Carleton Board's experiment with an increasing dosage (their CEL program -- 7 per cent in kindergarten to grade 3; 20 per cent in grades 4 to 6; 80 per cent in grades 7 and 8) had to be abandoned because of administrative and cost considerations.

We noted that there are hints in the data that support the common sense notion that a maintenance program is necessary to consolidate and build on the initial skills developed during the intensive phase of an immersion experience. Exactly how much time must be devoted to maintenance cannot be extrapolated from the data, but all the programs examined in detail provided some maintenance into the secondary years.

The need for maintenance is a corollary of the hypothesis proposed that seems to explain the data in the various research studies. This hypothesis assumes that cognitive development (loosely defined) proceeds more or less concurrently with the development of linguistic (L1) skills: that is, that the ability to handle increasingly complex concepts and their interrelationship is dependent on the development of language to encode these (with no statement of whether language leads or follows, but with the idea that either a lead or a lag between the two is very short).

The hypothesis is that L2 learning has two somewhat overlapping phases: an initial phase when the second language acquisition is simply the learning of a second way of encoding cognitions that have been learned previously and that the student can encode in his L1; and a subsequent phase, that occurs after his L2 has caught up with his cognitive and L1 knowledge,

during which his L2 skills are, like his L1 skills, developing concurrently with his cognitive development.

The hypothesis indicates that first phase L2 skills can be learned very quickly, dependent only on their being presented to a student who has the time and motivation to learn, while second phase L2 skills can be acquired only as part of a normal developmental sequence as the cognitions that they encode are learned. (Note that it is possible, in some immersion learning situations, that the student will be learning some cognitions together with L2 development and only later, or never, learn the L1 encoding for this understanding.)

The hypothesis predicates a ceiling effect on rapid L2 learning imposed by the learner's cognitive development. Initially, for all learners (except infants) the ceiling is well above the learner's L2 knowledge, and so learning can occur quickly to reach (or nearly reach) the ceiling. Then L2 learning slows down to keep pace with normal cognitive and linguistic development. However, for learners beginning at later grades, with their more developed cognitive ability, the ceiling is "higher" initially than for learners beginning younger. The more efficient first phase learning contains more L2 structures and vocabulary for older than for younger beginners.

The hypothesis also indicates the importance of continuing L2 learning so that L2 skills will not become cognitively "obsolete" as the learner develops. It should also be noted that this hypothesis also predicts that the curriculum can act as a ceiling for L2 learners, since if they are not exposed to the vocabulary and structures for which they possess the cogni-

tions, or if they are not given enough time to learn (and more time is needed for slower learners), these structures will not be acquired. Thus, differences in curriculum can explain differences among programs in scores on tests of different skills.

The considerations presented would indicate to the program planner that starting age is not very important, but that the beginning learner of French (whatever his grade) should have the opportunity, in terms of the curriculum presented to him and the hours allocated to learning French, to learn those structures and vocabulary that would be known by francophone peers of his age and ability. He will learn these "efficiently." After his skills are more or less on a par with francophone peers, the daily "dosage" of French must be great enough to enable the student to keep pace with his francophone peers.

One of the programs reviewed, Mille Iles, was not an immersion program, but rather explicitly followed a two-stage plan of an intensive period (three-and-a-half-months) devoted to what we have termed phase one L2 learning, followed by a maintenance phase (phase two learning).

The "Other Things"

In this discussion we have looked at the implications of alternative programs only for the learning of French and, at that, only for the French skills that tests of comprehension, grammar, spelling, writing and the like have measured. It is only within this framework that we can say that starting age is not very important or that maintenance programs must merely enable the student to keep pace with Francophone peers.

However, it is apparent that there are other aspects of the programs that must be considered.

For one thing, the later the programs are started the more likely they are to discriminate against some types of students even enrolling in French immersion. The tracing of students by the OBE Research team shows, for example, that later-entry programs enroll fewer boys than girls (whereas the kindergarten-entry immersion enrolls them in equal numbers) and that the late-entry program is even more discriminatory than the early one in terms of taking in only the brighter students. It was not possible to find elsewhere data reproducing these results, but neither was there any contradictory evidence.

The available IQ data for all the French immersion programs studied here indicate a strong tendency for children in immersion to be average or above. Most research where IQ measurements have been made indicates means in the neighbourhood of 110.

However, it need not be so. Genessee (1976b) has looked at the performance of students of lesser ability (although still within the "normal range") and found that they, too, do as well as their grade and IQ peers both learning the subject matter taught through the medium of French and, in addition, learning a second language. The Edmonton Public School Board (1979b) reports that students in its Ukrainian bilingual program have a mean ability almost exactly the same as those in the student body as a whole.

Thus, research indicates that for primary-entry French immersion there is little reason for ability discrimination. Not only is screening apparently unnecessary, but testing of young children tends to be expensive. Therefore, the choice of immersion or not at the kindergarten level is truly the parents' choice. For later-entry programs, the same situation is not the case. By the end of the primary years, children have been evaluated by the schools. Even were choice left freely to parents, we would expect those

early evaluations to weigh heavily in parents' decisions. Thus, later-entry programs would tend to be more elitist than early-entry programs and some students who would, in fact, do well in immersion would not think to try.

Another consideration that may weigh in favour of early-entry immersion in spite of its need for a long period of maintenance, is in the development of good work habits, self-esteem and positive attitudes to school. The Bilingual Education Project of OISE (Swain and Barik, 1977; Andrew, Lapkin and Swain, 1980; Barik and Swain, 1976b) found that although the differences were not always statistically significant, the immersion students from grade 4 up consistently score better on their work-study skills than do comparison students. Work with immersion students at the Protestant School Board of Greater Montreal found grade 7 entry immersion students with a more positive self-image than the English program controls (PSGBM, 1972; Genessee, Morin, Allister, 1974). On an individually-administered measure of self-esteem given before entry into kindergarten and again at the end of the school year, a Plattsburgh group found that the immersion students' self-esteem had remained constant while the English controls' self-esteem had gone down, from being more positive than the immersion group to being less positive. The numbers of cases, however, were small (Samuels and Griffore, 1979).

Although attitude measures may be viewed with some suspicion as to their validity, at least there seems to be consistency that favours the immersion students. Thus, we may believe that the immersion experience, at least, does no harm to self-esteem and work habits. It may provide a situation where the child learns something, and knows that he has learned

something. Often, too, that something is a skill that the parents value, but do not themselves know. For the bright average child from a middle-class home this learning experience may be a valuable alternative to the more usual kindergarten experience where, as Parson (1964) says, "the primary challenge to the pupil is not to his intellectual, but to his 'moral' capacities". The upper middle-class child may find that he is already well prepared for both the reading-readiness and math-readiness aspect and the proper "behavioural" aspect of the normal kindergarten, while the immersion kindergarten actually gives him the learning experience that he or his parents expected from school. The immersion experience could thus be considered as an enrichment program beginning at school entry for the top third or more of students, and is the only enrichment available for many of these brighter-than-average students who are not in the top 5 per cent of their group.

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